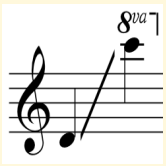
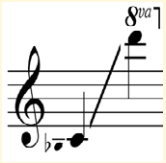
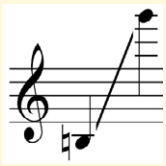
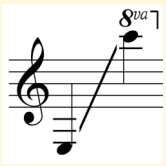
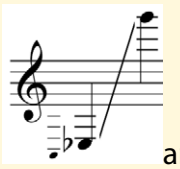
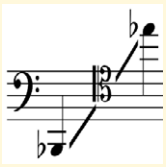
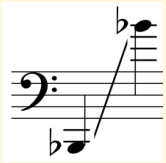
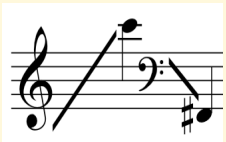
Ranges of Orchestral Instruments

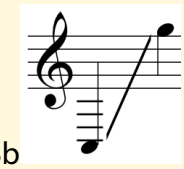
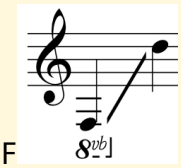
This table is offered only to show general information about the performing ranges of particular instruments. There are a number of variations in the type and manufacture of instruments as well as the ability of different performers. More specific information can be found in Norman Del Mar's *, Anatomy of the Orchestra*; Gardner Read's *, Thesaurus of Orchestral Devices*; Kent Kennan's *, The Technique of Orchestration*; and Philip J. Lang's *, Scoring for the Band*. But, perhaps the best resource in a particular case would be the instrumentalists of your ensemble.

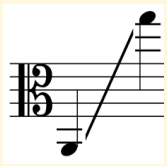
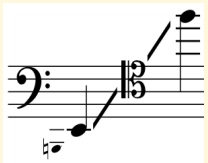
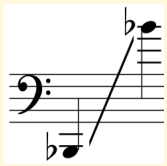
Quicklinks: WOODWINDS - BRASS - PERCUSSION - KEYBOARD - STRINGS

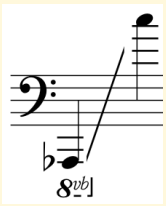
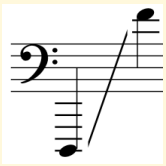
INSTRUMENT	CLEF(s)	WRITTEN RANGE (C4=middle C)	SOUNDING (transposition) ...than written	COMMENTS
WOODWINDS				
Piccolo		D4-C7	C: 1 octave higher Db: minor 9th higher	
Flute(in C) or Querfloete		C4-D7		Professional model flutes may employ a B-footjoint which allows them to play 1/2 step lower. There are a few isolated instances of a low Bb in the flute literature but these are rare.
Alto Flute(in G)		C4-C7	a Perfect 4th lower	The Alto Flute is sometimes incorrectly referred to as a Bass Flute. There are also a number of other designs for low-pitched flutes which are not generally used in an orchestra except for special situations.
Oboe		Bb3-A6		

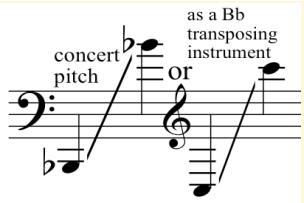
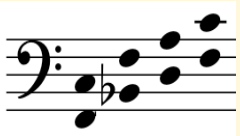
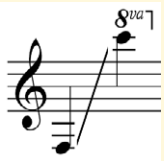
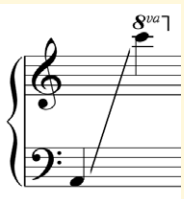
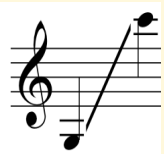
				
Oboe d'amore		Bb3-E6	a minor 3rd lower	
English Horn		B3-G6	a Perfect 5th lower	written in alto clef at concert pitch in certain Russian scores. It is similar in pitch and tone to the earlier instrument, Oboe da caccia. Here is a comparison of three instruments in this family.
Heckelphone/ Bass Oboe		A3-G6	1 octave lower	
Clarinets (Bb-Eb-A)		E3-C7	Bb: a whole step lower A: a minor 3rd lower D: a whole step higher Eb: a minor 3rd higher	
Basset Horn		C3-G6	a Perfect 5th lower	
Bass Clarinet in Bb	 and 	Eb3(or C3)-G6	a 9th lower; a whole step lower when written in bass clef Treble clef in Bb transposition is preferred modern	Professional models can play down to concert B-flat below the bass staff (written C3). There are examples in the classical literature, especially in 19th century works, for Bass Clarinet in A or C and written in bass clef or a mixture of bass and treble clefs. This is not advisable for the modern composer as these instruments are rare to non-existent and this will only

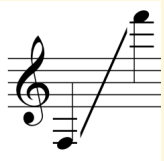
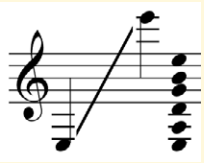
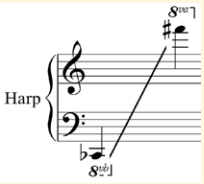
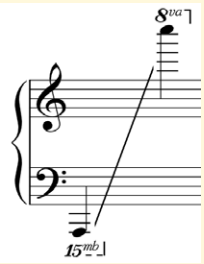
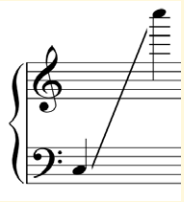
			notation.	cause problems for the player involved.
Bassoon		Bb1-Eb5		
Contrabassoon (Sarrusophone)		Bb1-Bb4	1 octave lower	Use of tenor clef for contrabassoon is rare.
Saxophones		Bb3-G6	Bb soprano: a whole step lower Eb alto: a 6th lower Bb tenor: a 9th lower Eb baritone: 1 octave+6th lower Bb bass: 1 octave+9th lower	At one time there were a family of saxophones in F and C but they are no longer manufactured. There also exist some exotic saxophones.
				Quicklinks: WOODWINDS - BRASS - PERCUSSION - KEYBOARD - STRINGS
BRASS	**Clef(s)**	**Written**	**Sounding**	
Horn in F (double horn)		F#2-C6	a Perfect 5th lower	Horns may be written in a number transpositions: C, D, Eb, E, F, G, A alto, Bb alto, Bb basso, B(rare) Among horn players, transpositions are spoken of in terms of the Horn in F (ex. Horn in Eb is a whole step lower) Orchestral horns have a double tubing system constructed for fundamental tones in F and Bb. However, some use a single tube system.
				Tuben or Wagner tubas are

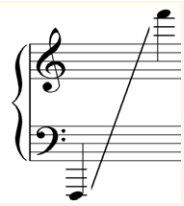
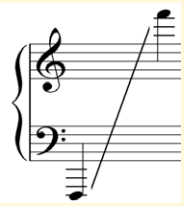
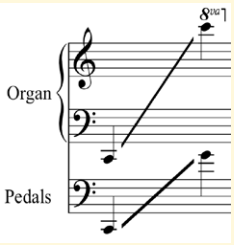
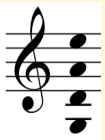
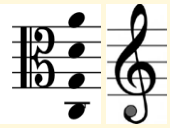
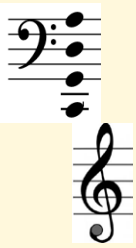
Tuben, Wagner tubas (double tuben shown here)	in Bb  and in F 	Bb: C3-G5 F: F2-D5	tenor in Bb: a whole step lower bass in F: a Perfect 5th lower	played by horn players. Note that valves are played with the left hand. The sounding pitch of a Bb tenor instrument playing from a part written in treble clef should be a 9th below the written note. However, the practical realizations of hornists are not entirely consistent on this point. ex. Stravinsky, Rite of Spring Tuben also have parts written in E-flat (sounding a 6th lower than written) in The Ring of the Niebelungen.
Trumpet		F#3-D6	C: (as written) Bb: a whole step lower A: a minor 3rd lower G: a Perfect 5th higher F: a Perfect 4th higher E: a major 3rd higher Eb: a minor 3rd higher D: a whole step higher	for a detailed explanation of trumpet characteristics, see Del Mar, *Anatomy of the Orchestra*
Piccolo Trumpet		F#3-G5	Bb: a minor 7th higher A: major 6th higher	sometimes written F#4-G6 Bb: sounding 1 step lower A: sounding a minor 3rd lower
			[cylindrical] Clarino trumpet Trumpet with	Clarino Trumpet: for baroque period and earlier; before the invention of valves. Trumpets with rotary valves are generally used for 19th century orchestral works. Trumpet in F: very common in 19th century works. Bass trumpet: plays in treble clef in Bb or in *bass clef (sometimes

Trumpet family: cylindrical and conical	 *see note regarding clef for bass trumpet		rotary valves Trumpet in F Bass Trumpet [conical] Cornet in Bb Flugelhorn Posthorn Pocket Trumpet	tenor). Frequently played by a trombone player. Bb Cornet: transposition and playing range, basically the same as Bb Trumpet. Often used in pairs with trumpets. Flugelhorn: same as Bb trumpet but not for upper range. More mellow sound, softer. Posthorn: not generally for orchestral works but posthorn (with valves) is scored in Mahler Symphony No. 3. Pocket trumpet: in Bb, generally poor sound and intonation.
Alto Trombone		A2-G5		Used primarily, but not exclusively, in 18th and 19th century German orchestral works.
Trombone (Tenor Trombone) Trombone (no valve, straight)	 *treble (see note)	E2-F5	*a 9th lower, when written in treble clef as a Bb transposing instrument.	Pedal tones G1-Bb1 are possible. Use of the valve called the F-trigger engages an additional length of tubing and facilitates pitches from F2 down to C2, or B1 with the F-slide extended. *British Brass Band music for Trombones in Bb is written in treble clef where the sounding pitch is a 9th below the written pitch.
Bass Trombone		Bb1-Bb4		Trombones, especially Bass Trombones come in a variety of design configurations according to manufacturer.
				Although the name implies an octave transposition - as in contrabassoon or contrabass - the contrabass trombone plays at concert pitch, no transposition. It is primarily called for in a few select works of Wagner, Strauss, Schoenberg

Contrabass Trombone		Ab0-C5		and Puccini. Instruments are built with fundamental tones of F, E-flat, BBb, and others in first position. The shape and design varies from straight with slide handle extension to double valve and double slide models. The chioce of which instrument is most appropriate in any given situation is the players chioce. There is no standard configuration of tubing for Contrabass trombones.
Tuba		D1-F4		Orchestral tubas play at concert pitch regardless of the pitch of a particular instrument. In the British brass band tradition, Eb and Bb tubas are written in treble clef. The Eb tubas sound 1 octave+a 6th below the written note while the Bb tubas sound 2 octaves lower than written. The Bb tubas are technically BBb (double-Bb) tubas. The F Tuba is a smaller, lighter instrument primarily used for solos. Prior to the invention of the modern tuba in 1835, the ophecleide may have been used.
Tenor tuba,		Bb1-Bb4 in	Bb: a whole step lower in bass as a	Both the German style Tenor tuba and English style Euphonium are common. They are identical in pitch and therefore interchangeable for all practical purposes. This instrument should not be confused with the Bb or F Wagner tuba (also called *tenor tuba*) played by horn players, though they have a similar appearance. Note that valves on

Euphonium	 sometimes tenor	bass	transposing instrument, a 9th lower in treble	the tenor tuba/euphonium are played with the right hand. When writing for this instrument in bass clef, it is advisable to notate at concert pitch. Tenor clef may also be used. In orchestral works prior to the mid-20th century, the euphonium written in bass clef frequently employs B-flat transposition. This is not advisable in modern notation.
				Quicklinks: WOODWINDS - BRASS - PERCUSSION - KEYBOARD - STRINGS
PERCUSSION	**Clef(s)**	**Written**	**Sounding**	
Timpani	 standard set of 4 drums	20": F3 C4 23": D3 A3 26 25": Bb2 F3 29 28": F2 C3 32 30": D2 A2		in some cases of older notation, timpani is written in C with the root pitch indicated (ex. Timpani in D) Some timpani, ex. this high-pitched drum, may have a gear tuning mechanism.
Xylophone		F3-C7	1 octave higher	
Marimba		(C2 to A2)-C7		some models of marimba have extended lower ranges
Orchestra Bells also Glockenspiel		G3-C6	2 octaves higher	when notes exceed the range of the instrument the effective transposition is 1 octave higher. The glockenspiel typically used by marching bands is the same instrument but has two fewer notes on the bottom and three

				fewer on the top; mounted in a lyre-type frame.
Vibraphone		F3-F6		
Chimes		C4-F5		individual chimes may extend the range of a standard set of chimes
Guitar		E3-E6	1 octave lower	Guitar, as with any string instrument, may extend the upper range depending on the player's ability.
Harp		Cb1-F#7		Harp pedals operate a mechanism by which each pedal changes the pitch of all of the strings of that pitch class: D-C-B--E-F-G-A
				Quicklinks: WOODWINDS - BRASS - PERCUSSION - KEYBOARD - STRINGS
KEYBOARD	**Clef(s)**	**Written**	**Sounding**	
Piano		A0-C8		
Celesta		C3-C7	1 octave higher	This instrument is sometimes refered to as the *Mustel celeste* in certain works of Tchaikowsky. Mustel was the original manufacturer. The Keyboard Glockenspiel is similar in sound and appearance to the celesta but smaller.
Harpsichord		F1-F6		

				
Harmonium		F1-F6		The harmonium is a small portable organ.
Pipe Organ console	 grand staff + pedal staff	C2-C7 (on tracker organs) Pedals C2-G4 (F4 on German organs)	Manuals, as written (can be 1 octave lower or 2 octaves higher with registration); Pedals, 1 octave lower (can be up to 1 octave higher with registration.	These ranges also apply to electronic organs that are designed to simulate pipe organs; non classical electronic organs often have shorter than standard manual and pedal keyboards. (contrib. Randall Wilkins)
				Quicklinks: WOODWINDS - BRASS - PERCUSSION - KEYBOARD - STRINGS
STRINGS	**Clef(s)/Tuning**	**Written**	**Sounding**	
Violin	 treble clef is also called *violin clef*	G3-A7	no transposition, excepting scordatura	
Viola		C3-E6	no transposition, excepting scordatura	
Cello		C2-C6		The Viola da Gamba is similar in size to the cello but has 6 strings. It may be played by a cellist but usually by a gamba specialist. It is used in baroque

				period music.
Double Bass		C2-C5	1 octave lower	Double basses occasionally play in tenor or treble clefs(rare). The lower range of a bass may extend down to C by using a mechanical extension. Some basses have 5 strings to accomodate the low C.